DOCUMENT RESUME

ED 105 984 PS 007 830

TITLE	The Skandia Report: A Report on Children in Traffic.
INSTITUTION	Skandia Insurance Co., Stockholm (Sweden).
PUB DATE	Sep 71
NOTE	22p.; For resume to "The Skandia Report II," see PS 007 831
AVAILABLE FROM	Forlagstjanst, Skandia, S-103 60 Stockholm 3, Sweden (no price quoted)
EDRS PRICE	MF-$0.76 HC-$1.58 PLUS POSTAGE
DESCRIPTORS	Age Differences; Behavior Patterns; *Children; *Data Analysis; Driver Education; Injuries; Motor Vehicles; *Pedestrian Traffic; Sex Differences; *Traffic Accidents; Traffic Regulations; Traffic Safety; *Vehicular Traffic
IDENTIFIERS	*Sweden

ABSTRACT

This study examined the traffic accidents in Sweden during 1968 and 1969 in which children up to and including the age of ten were actively involved. The major goal of the study was to illustrate the traffic behavior patterns of children in this age group. Data were analyzed under two broad categories: pedestrian accidents and bicycle accidents. Material involving 1,906 accidents is presented and evaluated according to the following factors: (1) age and sex of the children and the drivers; (2) injury to the child; (3) length of time the driver had been in possession of a driving license; (4) the traffic category of the child and the driver (type of vehicle, tricycles, or prams); and (5) the hour, day of the week and month when the accident occurred. Other information describing the accidents was obtained from sketches and the brief written accounts given to the police and reported to the Central Bureau of Statistics at the time of the accidents. An interpretation of the accident data is included at the end of each section of the report. (CS)

ED105984

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

SKANDIA

PS 007830

THE SKANDIA REPORT

A report on children in traffic

Summary in English

September 1971

09002

THE SKANDIA REPORT

This study deals with traffic accidents in Sweden during 1968 and 1969 in which children up to and including the age of 10 were actively involved. By »actively» is meant that the children have been pedestrians, ridden bicycles or sledges, etc. Single accidents on bicycles or on foot have not been included. Accidents in which children have been injured as passengers have not been included since the aim of the study has been to illustrate the traffic behaviour patterns of children in the age groups concerned. However, accidents involving prams have been included since the children have been »led» by pedestrians.

The forms containing information about the accidents submitted to the Statistiska Centralbyrån SCB (The Swedish Central Bureau of Statistics) by the police authorities have constituted the source material for the study. These forms include a number of specified data, together with a sketch and a brief account of the course of events. The specified data utilized have comprised the ages and sex of the children and the drivers, the injury to the child, the length of time the driver has been in possession of a driving licence, the traffic category of the child and the driver, as well as the hour, day of the week and month when the accident occurred. The remaining information for the description of the accidents, such as the actions of the child, the conditions affecting range of vision and other circumstances at the time of the accident have been obtained from the sketch and the brief written account. All data have thereafter been classified in different categories.

The material comprises the 1,906 accidents of the above type involving children which have come to the attention of the police and been reported to the Central Bureau of Statistics. The representativeness of the official statistics has been investigated by Statens Väginstitut (The National Road Research Institute). It was discovered that during 1964 there were a total of 25,500 accidents with resulting personal injuries in all age groups (this value was obtained by a process of evaluation). It was estimated that at least 10,000 of these accidents were not reported to the police. On the other hand, no difference was discovered between injuries due to the accidents that were reported to the police and those not reported to the police.

In this study, the number of children injured in each traffic group, age group, etc. are therefore probably an underestimate of the actual number of children injured. The interpretation of accident data should be made against this background. However, the official statistics are relatively reliable with reference to fatal accidents.

00003

Among children, single accidents constitute the major part of the bicycle accidents (Thorson). Very few of these come to the attention of the police. This type of accident therefore constitutes an important percentage of the accidents which have not been included in this study.

Within 48 hours of an accident the police shall submit information about it to the Central Bureau of Statistics. This probably frequently implies that all witnesses to the accidents have not yet been heard and that as a consequence the police information is largely based on the statements of drivers. This is probably of importance with respect to such statements as whether the child ran or walked out into the roadway, while it probably is of lesser importance with respect to information about whether vision had been obscured or not.

In deciding whether to utilize extensive material which gives less thorough knowledge about traffic accidents involving children or less extensive material which gives more detailed information about each accident, it has been considered necessary to obtain a general overall view of how traffic accidents involving children in these relevant ages occur and which age groups are affected. The material presented here will form the basis for further, more detailed studies based on a sampling of the accidents, etc. However, the utilization of the study described here, together with child psychological and other facts reported in this publication, as a starting point has already provided a better basis for preventive measures than was available in the past.

Two follow-up studies are already underway at the Barnpsykologiska institutet (The Institute of Child Psychology). They will in all probability be reported towards the end of 1971.

Total material

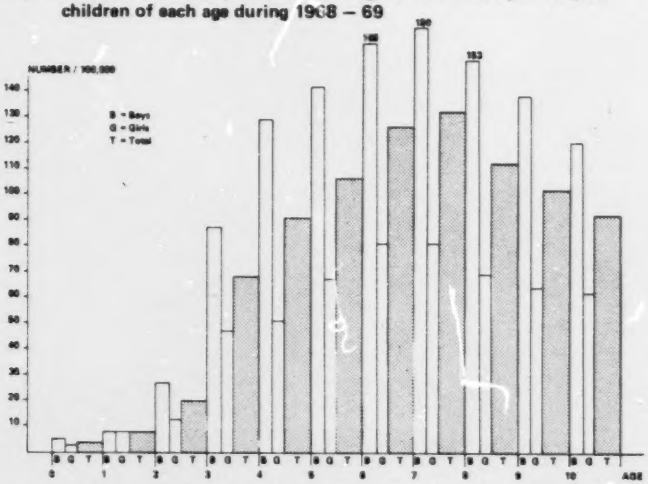
Number of accidents

During the two years 1968-69 there were a total of 1,906 traffic accidents in which children aged 0 to 10 years inclusive were injured as active road-users. Since the number of children in the relevant age groups varies, both the absolute number of injured children of each individual age is reported together with the number of injured children per 100,000 children in the same age group.

It will be noted that the number of injured children is very small in the very lowest ages but rises until the age of 7 when it reaches a peak and then slowly declines. However, it is still high among the nine-year-olds.

09601

Fig 1. Number of traffic accidents involving active children per 100,000 children of each age during 1968 – 69



As a consequence of the relatively small number of accidents in the lowest age groups, relationships within the »pedestrian accidents» category should not be interpreted before the age of three and within the »bicycle accidents» category before the age of four.

Categories of road-users

The great majority of the children were injured as pedestrians (1,204), almost twice as many as were injured when riding a bicycle (625). The next highest number were children on some kind of winter vehicle: »snow discs» or »flying saucers», sledges, sleighs and skis (a total of 47 children). These are followed by children in prams (20) and finally children on tricycles (9 children). See Figs 2 and 3.

Distribution of accidents by age

Among the pedestrians, the majority of accidents occurred between the ages of 3 and 8 years, among bicycle riders in the 7-10 year-old groups. If the relationship between the number of pedestrian and bicycle accidents is studied individually for each of the age groups, it is found that pedestrian accidents dominate from the time the children begin to walk up to the age of 9 years.

Fig 2.

Road-user category	0–10		
	B	G	T
Pedestrian	769	435	1204
Bicycle riders	498	127	625
Others	50	27	77
Total	1317	589	1906

00005

Fig 3. Number of accidents in »Other road-user categories« during 1968 – 69

Road-user category	Pram	Chair sledge	»Tea trays«	Sledge	Tricycle	Sleigh	Skis	Total
Sex	B G T	B G T	B G T	B G T	B G T	B G T	B G T	B G T
Number	9 11 20	9 3 12	15 8 23	5 0 5	8 1 9	1 2 3	3 2 5	50 27 77

Fig 4. Number of pedestrian accidents per 100,000 children in each age group during 1968 – 69

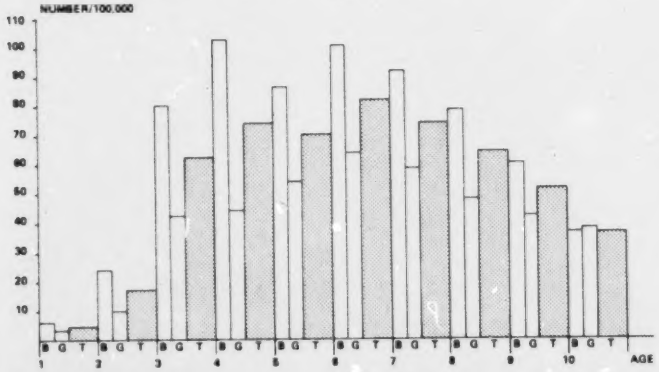
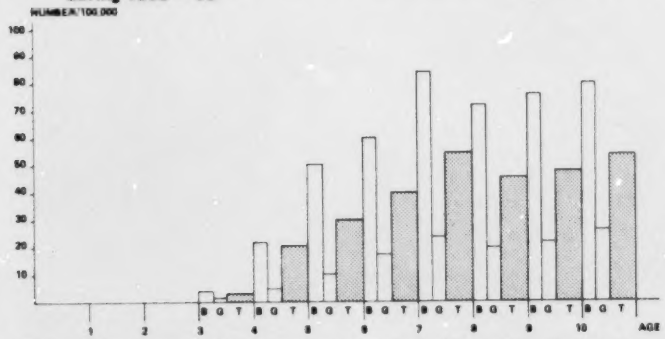


Fig 5. Number of bicycle accidents per 100,000 children in each age group during 1968 – 69



Bicycle accidents did not occur before the age of three but then increased continuously. In the 10 year-old group more children were injured in bicycle accidents than in pedestrian accidents. See Figs 4 and 5.

Sex differences

During the years in question, 1968-69, approximately twice as many boys as girls were involved in traffic accidents. In all age groups the girls were involved in more pedestrian than bicycle accidents. On the other hand, 8 year-old boys were involved in an equal number of pedestrian and bicycle accidents and in the

00006

older age groups bicycle accidents predominated among the boys. The difference between the sexes with respect to pedestrian accidents was significantly less and, in addition, an equalization of these accidents takes place with increasing age so that by the age of 10 years an equal number of boys and girls are injured as pedestrians. In the case of other types of accidents there were approximately twice as many boys as girls.

The child's injury

The children were injured to approximately the same extent whether they were pedestrians or rode bicycles. But among the other groups of accidents (those who used snow discs, etc.), there were relatively more fatal accidents and only minor injuries were sustained less frequently than when they rode bicycles or walked. Fatal accidents among children under the age of 2 years were relatively more frequent than among the older children; children in prams were killed in 1/4 of the cases. However, only a few cases are concerned.

The children in the two oldest age groups sustained minor injury to a greater extent than the younger children. Even 10 year-old bicyclists sustained less injury than the younger riders of bicycles.

Accident distribution by month, day of the week, time of day

In the total material most accidents occurred during May and August but June and September also showed a high accident rate. On the other hand, relatively few accidents occurred during the winter months. The children suffered the smallest number of accidents during January.

As may be observed in the monthly distribution for the different groups of road-users, there is some difference between pedestrians and bicyclists. Most of the pedestrian accidents took place in May and October; the largest number of bicycle accidents in August. In general, pedestrian accidents were more uniformly distributed over the entire year than bicycle accidents, which occurred most frequently during the period May-September. Accidents involving other groups of road-users chiefly took place during the winter . . they were dominated by accidents involving winter vehicles.

Age differences in relation to the monthly distribution

Among 7 year-olds, more pedestrian accidents occurred during September and October than during the summer months. No corresponding increase of a similar extent took place in the other age groups. The accident peak for 7 year-old bicyclists was in August but September was also relatively high. The differences between the 7 year-olds and adjacent age groups was, however, small.

00007

Sex differences

There was no difference between boys and girls with respect to the distribution of accidents by month.

Days of the week

The major part of the accidents occurred during the period Monday to Friday. The greatest number of accidents occurred on Fridays but the difference between the days of the week were relatively small. The fewest number of accidents took place on Sundays, followed by Saturdays. No differences with respect to sex have been observed in this connection.

Varitions in the time of day

Scarcely any accidents at all occurred before 8 a.m. or after 7 p.m. The greatest number of accidents took place after 2 p.m. in the afternoon. Almost half of all accidents took place between 2 p.m. and 5 p.m.

No sex differences with respect to distribution by time of day have been observed.

Comments

It is self-evident that the youngest children have very seldom been involved in traffic accidents: they are outdoors fewer hours a day than the other children and they are seldom left outdoors alone. But it is surprising that children in prams were involved in as many as 20 accidents.

From other studies it is known that children as young as 2-3 years are sent out to play alone. The number of accidents then also rises rapidly.

Children of 4-7 years are permitted to be outside alone to an increasing extent, which is reflected in the increase in the number of accidents. At the age of 7 years the entire age group is forced out into traffic for the first time when they begin school. The fact that 7 year-olds, but no other age groups among children, are involved in a somewhat greater number of accidents in September and October constitutes a reason for making a more careful study of the reasons for this increase at a later date. That the number of accidents is still high all through the lower elementary school years shows how impossible it is to adapt small children to the modern traffic environment.

The distribution of accidents between pedestrians and bicycle riders is in agreement with earlier Swedish studies: all children are outside on foot as soon as they can walk. Bicycle riding comes later. In the study made in 1969 by Trafiksäkerhetsverket (The

09008

Road Safety Commission) concerning 7-10 and 11-14 year-olds, bicycle accidents dominated first after the age of 11 years.

If a comparison is made with foreign studies, it is always found that among unprotected road-users, children sustain the most damage after old people. Among pedestrian children the 3-9 age groups are usually injured most frequently. The age at which bicycle injuries begin to appear and when they reach is determined by the age at which the respective country permits children to ride a bicycle in general traffic.

Internationally, as in the Skandia report and other Swedish studies, boys are involved in more traffic accidents than girls. This is usually attributed to several factors. Some studies indicate that boys take more risks, others that they are permitted to be outdoors during a greater part of the day, that they are left alone outdoors more than girls, are permitted to ride bicycles earlier than girls, etc.

The time of the day and the day of the week is also in good agreement with international findings, as well as with Swedish studies undertaken in recent years. The monthly distribution May-September is in agreement with the latter. On the other hand, the statistics in various countries differ somewhat in this case due to differences in climate, daylight conditions, etc.

The risk of being killed in connection with traffic injuries is higher among the 0-10 year-olds than in any other age group before retirement age. Ekström i.a. states that although traffic accidents only amount to approximately 1/10 of all accidents involving children during the course of a year, they still constitute approximately 1/4 of all children's accident cases admitted to hospital and that 35 % of these are fatal accidents. The majority of injuries suffered by the children are to the head and face, followed by the extremities and the trunk. Combinations of injuries naturally occur.

Pedestrian accidents

When a child pedestrian is injured in a traffic accident, the accident is usually entitled a »dashing out-accident» or a »sudden emergence accident». This term designates the accidents in which children are said to have run, jumped or »rushed» out into the vehicle. This is always the most common type of accident. Other types of pedestrian accidents are few and rather similar in number for all ages. If the individual age groups are studied, the proportion of dashing out-accidents among the entire number of pedestrian accidents is greatest in the 3-8 year-old groups, which also showed the greatest number of pedestrian accidents.

Before the age of three, the number of pedestrian accidents was relatively small.

No significant difference was found between the sexes with respect to the proportion of dashing out-accidents in the total number of pedestrian accidents. Boys as a whole were involved in more pedestrian accidents and boys were also involved in a greater number of dashing out-accidents.

Fig 6. Number of pedestrian accidents per 100,000 children of each age during 1968 – 69

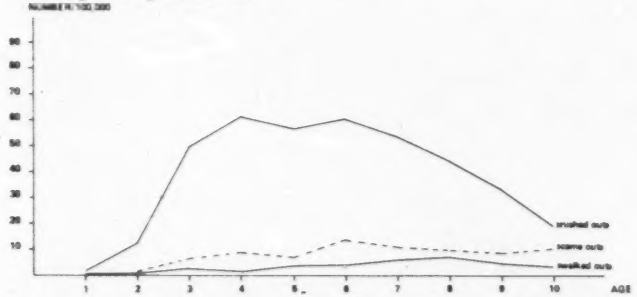
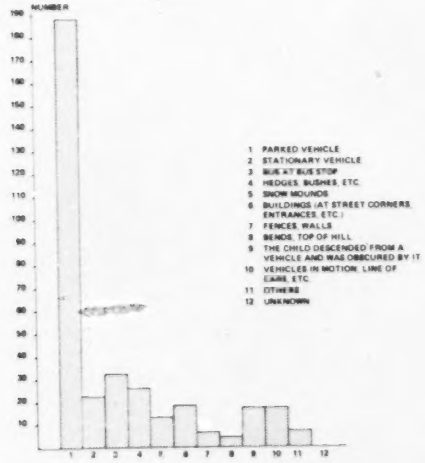


Fig 7 Number of pedestrian accidents with restricted vision distributed by obscuring object


NUMBER
1 PARKED VEHICLE
2 STATIONARY VEHICLE
3 BUS AT BUS STOP
4 HEDGES, BUSHES, ETC.
5 SNOW MOUNDS
6 BUILDINGS (AT STREET CORNERS, ENTRANCES, ETC.)
7 FENCES, WALLS
8 BENDS, TOP OF HILL
9 THE CHILD DESCENDED FROM A VEHICLE AND WAS OBSCURED BY IT
10 VEHICLES IN MOTION, LINE OF CARS, ETC.
11 OTHERS
12 UNKNOWN

Range of vision

Almost 1/3 of the pedestrian accidents (29.1 %) are said to have taken place when the range of vision was restricted. This percentage figure is in all probability an underestimate of the real percentage of accidents of this type since the police records do not always contain information about the range of vision.

00010

For all ages vision was unrestricted on more accident occasions than it was obscured. The number of pedestrian accidents when crossing the driver's path where vision was obscured was highest between the ages of 3 and 6 with a peak for 4 year-olds. The number of such accidents declined with the increasing age of the children.

What obstructed the range of vision?

In no less than 20.1 % of the pedestrian accidents the children were obscured by non-moving vehicles: parked cars, stationary cars and busses at bus stops. For the remainder, the children have been obscured when they descended from vehicles, by hedges, bushes, snow mounds, fences, walls, doors, street corners, etc. See Fig 7.

Where did the pedestrian accidents take place?

No less than 845 of the 1,204 pedestrian accidents took place on straight stretches of road. In the majority of cases the children were moving from one side of the road to the other. Next in order of frequency was that the child came out into the roadway from some driveway or moved from the roadway to a street entrance. In accidents on straight stretches it was also relatively common that the children emerged from a grove of trees, a ditch or the like or that they were beside or on the roadway itself even before the accident took place.

Pedestrian accidents in connection with street or road crossings were much more uncommon than straight stretch accidents. In the majority of cases these latter were a movement from one side of the road to the other. Accidents at crossroads were rare, as were accidents on pavements (sidewalks), courtyards, squares, etc.

Komments

»Dashing out-accidents» is a term coined by adults and expresses *their* view of the situation. From the children's point of view, it is the vehicle which »rushes» at them. Neither party anticipates the meeting with the other.

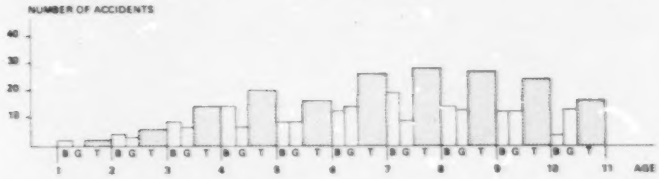
The term »dashing out-accidents» or »sudden emergence accidents» is used internationally in the same meaning as here in Sweden and the same age groups are always involved in this type of accident as we have found in Sweden.

With respect to the range of vision, the same mutual relationship exists as for »dashing out». The child is not visible to the motorist, neither is the motorist visible to the child. Most of these obscured children were 3-6 year-olds, i.e. very small in size, which makes it impossible for them to see and be seen if they wish to go out

09011

between parked cars, for example. That stationary vehicles restricted vision in as many as 1/5 of all pedestrian accidents constitutes an indictment against the authorities. Previous Swedish studies have shown that small children prefer to cross the road on straight stretches since they believe that they can more easily see the motor traffic there than at street-corners where too many things happen at once. This is in agreement with international experience.

Fig 8. Number of accidents at pedestrian crossings involving boys and girls respectively in each age group.



Pedestrian crossings

No less than 14.7 % of all pedestrian accidents took place at marked pedestrian crossings. The ages most frequently involved were the 6-9 year-olds. The proportion of all pedestrian accidents which took place at pedestrian crossings in each age group increased from the age of five and reached a peak at the age of 9 (23 %). The values for the 7, 8 and 10 year-olds were, however, very close to those for the 9 year-olds.

The large number of accidents at marked pedestrian crossings motivated a more detailed analysis of this type of accident. The investigation records and memorandums from the police authorities concerned were requisitioned for all 177 of these accidents. 166 accidents of this type have been included in the compilation below, the remainder constituted the non-response.

Age, sex

94 boys and 83 girls were involved in accidents at pedestrian crossings. It is to be noted that the number of girls was larger in this group than for pedestrian accidents in general. The difference between boys and girls was most distinct in the 8-10 age groups but also clear in the 5-6 year groups.

The child's behaviour at the time of the accident

The majority of the children (100) ran out into the roadway at the pedestrian crossing. 54 children walked out, 6 walked out but began to run when they caught sight of the approaching car. 3 children walked out but began to run even though they say that they did not see any car. One child ran out into the road

00012

and stopped when he caught sight of the car. In two of the accidents it is not known whether the child walked or ran.

The child's behaviour immediately prior to the accident

In the great majority of the accidents at pedestrian crossings (104) the child stood still beside the crossing or stopped there before going out into the roadway. In 16 cases the child ran up to the pedestrian crossing and continued to run out into the road without stopping first. Eight children were playing at the pedestrian crossing and emerged during play. Six of the children approached the pedestrian crossing and continued out into the roadway without stopping. In 32 cases it is not known how the child acted prior to the accident.

Did the child look around?

Unfortunately, in the majority of cases (106) it is not known whether the child looked for approaching cars before going out into the road at the pedestrian crossing. In 39 of the accidents the child has looked, in 21 the child has not done so. Of the 39 children who did stop and look around, 26 had acted correctly but in 8 of these cases the child was not visible to the driver immediately before the accident. In 10 of the accident cases the child only looked in one direction instead of in both directions. Two children looked in the wrong direction in a one-way street. One child looked around quite correctly but waited too long before going out into the street. Almost all of the children who looked around before they went out into the pedestrian crossing were from the group who stood still beside the crossing or stopped at it. The children who did not look were among those who had acted in several different ways.

Obscured vision at the pedestrian crossing

Vision was obstructed in no less than 48 accidents at marked pedestrian crossings. In 16 cases it was restricted by stationary vehicles, in 14 by moving vehicles, in 12 by parked vehicles and in the other 6 cases by bushes, snow mounds and poles.

Children alone, accompanied children

Most of the children involved in accidents at pedestrian crossings were accompanied at the time (99). The majority of these were accompanied by friends (60 cases). In more than half of these cases (35) the friend or friends remained on the pavement when the child went out into the roadway. In 16 cases the injured child's friends acted in the same way as the injured child but generally avoided being hit.

35 of the children were accompanied by adults. In no less than 15 of the cases the accompanying adult acted in the same way as

00013

the injured child. In 14 cases the adult was only near the child when the accident took place.

Children in the younger age groups were more frequently accompanied by adults than the older children, who instead were with friends.

Only 4 children were accompanied by older children who were in charge of them.

The child's injury

In accidents at pedestrian crossings the child's injury was relatively less severe than in the other pedestrian accidents during the years in question, 1968-69. The drivers may possibly have been more attentive at the pedestrian crossings than on other occasions. The drivers may also have maintained a lower speed at corners – where the majority of pedestrian crossings are located – than on the straight stretches which show the largest number of other accidents.

Comments

The children who were injured at pedestrian crossings were, ironically enough, chiefly children in the oldest pre-school age groups and in the first school years, i.e. the ages when the child has been admonished to cross roads and streets at such places, has remembered the warnings and obeyed them. Small children often believe that, as at »home base» in running games, they are protected at pedestrian crossings in the traffic environment. That girls were involved in a relatively larger number of accidents at pedestrian crossings than boys is probably due to the fact that they prefer to avoid risks and therefore prefer to »go to home base» more than the boys.

The majority of the children stopped before they went out into the roadway. They probably tried to act correctly but were unable to take in the entire situation and act accordingly. The other actions described are also in complete agreement with what can be expected of children at these ages. The children's way of looking around gives them a great deal less information than that acquired by an adult. Several of the investigations conducted by the Institute of Child Psychology have yielded results similar to those in the Skandia report.

It is surprising that vision was obscured in so many of the accidents at marked pedestrian crossings, which are presumed to be free of parked cars, at least.

In several cases the accidents occurred when a child was accompanied by an adult who believed that he/she exercised good supervision over the child by holding it by the hand or by walking be-

99011

side the child at the pedestrian crossing. The child has then suddenly run ahead. The adult – or an older child with a supervisory function – is helpless in such cases. Children's hands are not held in an iron grasp and their rapid action therefore comes as a surprise.

Information about where the child came from and where it was going are in accordance with earlier information about the action radius of children in the pre-school and early school ages. Children move within relatively small circles between their homes, the day care centre, the playground, school and shops.

The behaviour pattern of the drivers

Approximately half of the drivers who were involved in accidents at pedestrian crossings with free vision saw the children at the side of the road or when they were approaching the pedestrian crossing. The other drivers with free vision saw the children first when they were out in the roadway. In approximately 1/3 of the accidents with free vision in which the child stopped before the pedestrian crossing or stood still beside it, the driver says that he did not see the children before they were out in the roadway – a value which may be higher since the actions of the children are unknown in 18 of the accidents in which the driver first caught sight of the children out in the roadway. Two drivers saw the children beside the road and one driver saw the child approach the pedestrian crossing even though vision in all three cases was obstructed at the time of the accident itself.

Only eight of the drivers who had seen the children beside the road or when approaching the pedestrian crossing slowed down and three stated that they had kept an eye on the children. The majority said that they did not reflect on the behaviour of the children or believed that the children would remain beside the road and give the driver right of way. In some cases no information has been given.

19 drivers passed other cars which had already stopped at the pedestrian crossing to allow the children to cross the road.

151 drivers were driving straight ahead and 14 were turning the corner at the time of the accident.

Traffic lights

17 of the children went out into the pedestrian crossing at the green light, one child walked on green when the light did not function on the driver's side. 14 children crossed the road at the red light.

99015

Fig 9. Driver and children who drove resp. walked on red or green light.

Driver \ Child	On red	On green	Total
On red	1	10	11
On green	13	6	19
Total	14	16	30

19 of the drivers had driven at the green light but 11 at a red light.

It is noteworthy that in six of the accidents which occurred when the driver had a green light, the signal was also green for the children. On five of these occasions the driver was turning the corner and the children have therefore had right of way. In one accident the driver drove against a yellow-green signal but did not pass the pedestrian crossing until the green light signalled to the pedestrians.

Legal indictment

Seventy accidents at pedestrian crossings during 1968-69 have not led to an indictment against the driver for careless driving. 61 such accidents have led to trial. Of the 19 accidents in which one car stopped to permit the child to cross the street but another motorist passed that car and injured a child, 15 were tried in court.

During investigation of the accidents, the child has been heard directly in 48 cases and through the parents in 28 cases. In 90 cases the child has not been heard. In the cases where the child has been heard 45 have in some way given an account of the course of events at the time of the accident.

In the investigation of 25 accidents other children have been heard as witnesses.

Comments

The behaviour of the drivers at marked pedestrian crossings has in a large number of cases been astoundingly ruthless. They »believe» that the children will stop and give the car right of way or they »don't consider» the behaviour of the children but pass other cars which have already stopped to permit pedestrians to cross the road, etc. It is also remarkable that many drivers have taken great risks with the lives of the children by driving against a red light or turning a corner when the child should have been given right of way.

09016

In addition to better instruction of motorists about children, stricter supervision of pedestrian crossings is required, perhaps also more severe penalties and/or suspension of the driver's licence for a longer period. Pedestrian crossings must not be permitted to become traffic pitfalls for pedestrians!

When legal indictment has been preferred, the child has been heard in some cases. It is sometimes impossible to question a child who has been injured in an accident. But this should be done in all cases where it is possible. The child in question may be the only person who can say why he ran out at the pedestrian crossing, etc.

It is also important to hear any possible child witnesses.

Bicycle accidents

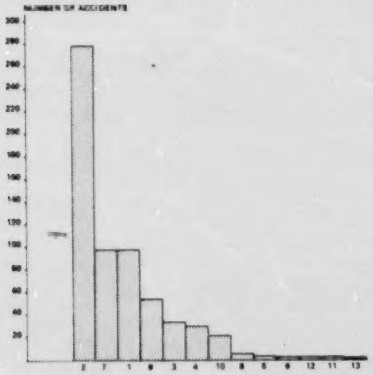
As was mentioned in the introduction, single accidents on bicycles are not included in this study.

Of the 625 bicycle accidents, the great majority occurred when the child on the bicycle and some vehicle crossed paths from different roads. The second most common case was that the child bicyclist and the other vehicle were proceeding in the same direction on the same road and the child swerved out in front of the vehicle. It was almost equally common that the child was injured when bicycling correctly but was overtaken by some other vehicle, etc. The bicycle accidents occurred for many different reasons: child and driver pursued opposing courses and the child swerved out in front of the vehicle or the child passed another vehicle or changed lanes and swerved out in front of the other vehicle or the child and the vehicle approached each other from different roads and the child swung out into the path of the vehicle so that their paths crossed or converged, etc. It should be noted that no less than 7.4 % of the bicycle accidents occurred on occasions when the child had been overtaken (had manoeuvered his bicycle correctly, wobbled or fallen) and an additional 2.9 % when another vehicle swung out in front of the child on the bicycle.

The so-called »dashing out-accidents» were taken up in the section on pedestrian accidents. These were the most common type of accidents when the children were on foot.

00017

Fig 10. The child's behaviour at the time of a bicycle accident



1 The child passes, i.e. rides straight forward (except in street crossing). (The vehicle driver takes one of the following actions)
2 The child and the vehicle pursue intersecting paths. -Ex
3 The child and the vehicle proceed on different roads, the child swerves out in front of the vehicle so that the paths intersect.
4 The same as 3 but converging course.
5 The same as 3 but other paths.
6 Child and vehicle are on the same road but on converging course.

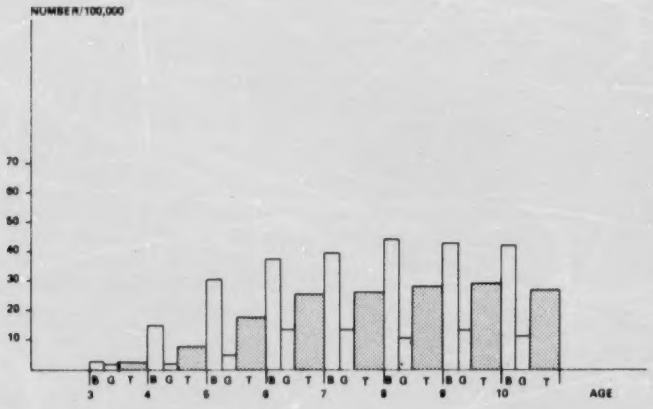
The child swings out in front of the vehicle when
7 The child and the vehicle follow the same route with the same course, the child swerves to the left.
8 The same as 7 but the child swerves to the right.
9 The child and the vehicle approach each other on the same road from opposite directions. The child swings out in front of the vehicle.
10 Encounter, the child cycles in the middle or on the wrong side of the road.
11 The child passes another vehicle.
12 The child changes lanes.
13 The child has caught up with the car.

Fig 11. Accidents in which the child has been »passive«, absolute figures and percentages of the total number of bicycle accidents

	Overtaking and passing				Child struck from behind	Collision on child's side of road	Hitting (unspecified)
	Child has not wobbled or fallen	Child has wobbled	Child has fallen off bicycle	Total accidents in overtaking and passing			
Number of accidents, 1968-69	18	26	2	46	12	8	10
Percent of total number of bicycle accidents	2,9	4,2	0,3	7,4	1,9	1,3	1,6

	Driver swerving out in front of child	Others	Total
Number of accidents, cont.	18	3	97
Percent of total number cont.	2,9	0,5	15,5

Fig 12. Dashing out-accidents on bicycle/100,000 children of each age and sex



00018

It is also possible to speak of »dashing out-accidents» in relation to bicyclists if it is thereby meant that the child suddenly appears in front of the driver or suddenly undertakes some unexpected manoeuvre in front of him. The speed of the bicycle is greater than that for »dashing out-accidents» on foot.

Among bicycle »dashing out-accidents» have been included such accidents as occurred at places where automobile traffic is permitted and common and those in which the child either swung out in front of the vehicle when it was driving in the same or the opposite direction or when the child emerged from driveways, roadsides, building lots, groves of trees, etc. and crossed the path of the vehicle. On the other hand, such accidents as took place at street crossings on an intersecting course have not been included since the cause of these accidents is not known. More than half of the accidents involving bicycles can thus be concidered to be »dashing out-accidents» (55 %).

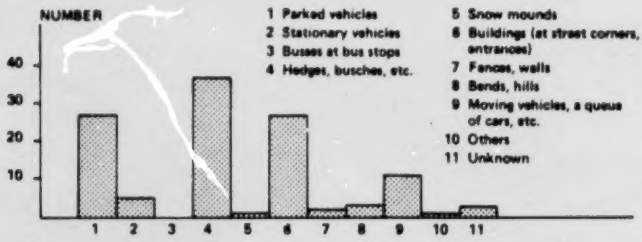
Between the ages of 6 and 10 years there were approximately an equal number of dashing out-accidents on bicycles for every age group.

No sex differences with reference to involvement in dashing out-accidents could be discerned. The number of this kind of accidents involving girls was approximately the same percentage of the total number of dashing out-accidents as the corresponding percentage for the entire number of bicycle accidents (24 5 and 25.5 % girls, respectively).

The number of bicycle accidents where children have suddenly emerged from somewhere amounted to 55 % of the total number of accidents involving bicycles, the swerving accidents amounted to 45 %. As was stated above, the percentage of dashing out-accidents involving bicycles was approximately the same for all ages between 6 and 10 years. The type of sudden emergence accident, however, was related to the child's age. The younger children emerged relatively more frequently from driveways, roadsides, etc. than the older children, while the latter instead relatively more often swerved out in front of some vehicle when they themselves were riding along the same road as the vehicles. At the age of 8 years there were approximately the same number of both types of accidents. Among 9 and 10 year-olds accidents involving those who themselves were out in traffic before the accident predominated.

99019

Fig 13. Number of bicycle accidents with restricted vision, distributed by the obscuring object.



Range of vision

The number of bicycle accidents with an intersecting course in which the child has been obscured rose up to the age of 5, remained equally high among 6 and 7 year-olds and then declined.

A comparison between girls and boys with respect to accidents with obstructed vision is uncertain. However, the impression remains that the girls were relatively more seldom involved in accidents where vision was limited than were boys.

What obscured vision?

The objects which obstructed vision in cases of bicycle accidents were usually distributed in a different manner than for pedestrian accidents. Parked, stationary vehicles and moving vehicles (for example, a row of cars) obscured vision in 6.9 % of the cases, next in order of importance were hedges, bushes, buildings on street corners, entrances and fences, walls, etc.

That the vision was limited by other vehicles is therefore much less common in cases of accidents involving bicycles than for pedestrian accidents. See Fig 13.

Comments

That children swerve out in front of a vehicle may have several causes. Riding a bicycle implies a coordination of many different functions. Small children can concentrate so intensely on the riding of the bicycle in itself that they forget the other traffic. Swinging out may also be due to the fact that the child wobbles or swerves and unintentionally happens to come into the path of another vehicle, etc. The child may judge the speed of the car incorrectly and believe that there is time to cross the road, etc.

The accidents where the child has acted entirely correctly but been crowded arouse the question of whether driving schools have given motorists adequate instruction on what small children on bicycles can actually be expected to manage.

99020

As in the case of pedestrian accidents, it is the youngest and therefore the smallest children who have been involved in accidents where vision has been obscured for both the motorists and for themselves. It is also observed that the most common category of obscuring objects in bicycle accidents was other cars, even if these did not obstruct vision as often for bicycle accidents as in the case of pedestrian accidents. Other categories of obstructing objects are more generally recognized as such.

Drivers involved in accidents

Age, sex, length of time driver's license has been held

The youngest drivers, aged 18-22 years, were involved in the majority of the children's accidents taken up here. The number of accidents then decreased with the rising age of the drivers.

The drivers involved in accidents were almost exclusively men.

The age of the drivers and the length of time they had possessed a driving license was related. Drivers with new driving licences struck more children than drivers with older licenses, however, drivers with completely new driving licenses were involved in fewer accidents than those whose licence was 1-5 years old.

10 drivers who were involved in accidents with children had no driving licence at all.

The child's injury in relation to the age of the driver

Drivers in the age groups under 18 caused no fatal injuries to children involved, which is probably due to the fact that their vehicles were not cars but bicycles, mopeds and motorcycles. However, children injured by these very young drivers were more often seriously injured than slightly injured, which is not the case among the children who were injured by vehicles operated by older drivers.

In the age groups over 18 the percentage of children killed was rather constant with the exception of the group 48-52 years which was involved in more fatal accidents than the other categories.

Comments

Both in Sweden and internationally, younger drivers are involved in more traffic accidents. It is natural that most of the drivers were men since they operate motor vehicles to a greater extent than women. Whether women are more inclined to exercise caution with respect to children in traffic is not known.

09021

It is also well-known that during the first years they hold a licence, motorists are involved in more accidents than during later periods. Perhaps more thorough training in the drivers' schools concerning human patterns of behaviour, primarily those of children and old people, would act as a preventative measure for this type of accident.

00022